



PATENT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Inventor:	KUSHWAH et al.	Examiner:	Belix M. Ortiz
Application No.:	10/816,202	Art Unit:	2164
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Title:	SELECTIVE DATA RESTORATION		

DECLARATION UNDER 37 CFR § 1.131

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

We, Ajay Pratap Singh Kushwah & Venkatesha Murthy, declare as follows:

1. Exhibits A C show a version control tool used to track bugs and changes in the source tree and in particular shows saved information associated with the identifier "LGTpa45351." Exhibit A shows the problem description, Exhibit B shows the resolution description, and Exhibit C shows the source code files (including version number and date) associated with identifier "LGTpa45351." The source code files associated with identifier "LGTpa45351" include an actual reduction to practice of the subject matter recited in claims 1, 20, and 21; versions prior to "LGTpa45351" do not include an actual reduction to practice of the subject matter recited in claims 1, 20, and 21.

2. Exhibit D shows the differences between source code file BigCacheInterfaces.cpp version number 1.5.16.3 with a date of October 19, 2002 and the version immediately prior. Exhibit E shows the differences between source code file CelestraBigImpl.cpp version number 1.16.6.16 with a date of October 19, 2002 and the version immediately prior. Exhibit F shows the differences between source code file CelestraBigImpl.hpp version number 1.5.16.4 with a

date of October 20, 2002 and the version immediately prior. Exhibit G shows the differences between source code file MDImage.cpp version number 1.1.2.2 with a date of October 19, 2002 and the version immediately prior. Exhibit H shows the differences between source code file MDImage.hpp version number 1.1.2.2 with a date of October 19, 2002 and the version immediately prior. Exhibit I shows the differences between source code file getNext.hpp version number 1.1.2.2 with a date of October 19, 2002 and the version immediately prior. Exhibit J shows the differences between source code file rip.cpp version number 1.1.2.15 with a date of October 19, 2002 and the version immediately prior. Exhibit K shows the differences between source code file rip.hpp version number 1.1.2.3 with a date of October 19, 2002 and the version immediately prior. Exhibit L shows the differences between source code file rtrv\_filemd.cpp version number 1.1.2.11 with a date of October 19, 2002 and the version immediately prior. Exhibit M shows the differences between source code file rtrv\_filemd.hpp version number 1.1.2.2 with a date of October 19, 2002 and the version immediately prior. Exhibit N shows the differences between source code file rtrvsinglepass.cpp version number 1.1.2.12 with a date of October 29, 2002 and the version immediately prior.

3. "Receiving a request to restore a file system element" is performed by Exhibit N (rtrvsinglepass.cpp). "Determining an offset indicating where a record associated with the file system element is located within a collection of records, wherein the record includes metadata related to stored data to be used to restore the file system element" is performed by Exhibit D (BigCacheInterfaces.cpp), Exhibit F (CelestraBigImpl.cpp), and Exhibit G (MDImage.cpp). "Using the determined offset to retrieve the record from the collection of records" is performed by Exhibit G (MDImage.cpp), Exhibit J (rip.cpp), and Exhibit L (rtrv\_filemd.cpp).

4. Exhibit D (BigCacheInterfaces.cpp) creates an InodeIndex metadata table during backup. During backup, metadata of a backup image is obtained and saved as records in two tables: a file metadata table and a directory metadata table. The offsets of records in the file metadata table and directory metadata table are stored in the InodeIndex metadata table. Exhibit F (CelestraBigImpl.cpp) writes the backup image and the InodeIndex metadata table to tape. Exhibit F (CelestraBigImpl.cpp) is used for definitions and/or constants. Exhibit G (MDImage.cpp) writes and retrieves metadata tables to and from tape during backup and restore,

respectively. Each record in the file metadata table and directory metadata table is able to be accessed randomly/directly. Exhibit H (MDImage.hpp) is used for definitions and/or constants. Exhibit I (getnext.hpp) is used for definitions and/or constants. Exhibit J (rip.cpp) processes the directory and file metadata during restore. To do this, it first loads the InodeIndex metadata table before processing the directory and file metadata and only performs as much processing as needed by the entries in a retrieval tree. Metadata is processed by way of direct lookup using the InodeIndex metadata table. Exhibit K (rip.hpp) is used for definitions and/or constants. Exhibit L (rtv\_filemd.cpp) populates the retrieval tree with the location and size of every block in the backup image that belongs to particular inode (file element) entry in the retrieval tree. This is done for every file element in the retrieval tree in top down fashion by directly accessing a desired record in the file metadata table using the offset recorded in the InodeIndex metadata table. Exhibit M (rtv\_filemd.hpp) is used for definitions and/or constants. Exhibit N (rtvsinglepass.cpp) collects a retrieval list as user input and creates the retrieval tree. Starting from the root, it does a direct lookup in the directory metadata table and an inode number is attached to all entries in the retrieval tree recursively. A directory lookup table is maintained in memory to cache a previous lookup to avoid paying the same price for future lookups.

5. The source code files (Exhibits D – N) were tested and found to be operational prior to being checked into the version control tool. Exhibit O shows the document Restore\_Benchmark having a date of August 27, 2002. Exhibit P shows the contents of the document Restore\_Benchmark, including the amount of time required to restore some test cases with and without the improvements offered by the source code files (Exhibits D – N).

6. Identifying a file system element for restoration by “receiving a request to restore a file system element; determining an offset indicating where a record associated with the file system element is located within a collection of records, wherein the record includes metadata related to stored data to be used to restore the file system element; and using the determined offset to retrieve the record from the collection of records” as recited in independent claims 1, 20 and 21 was reduced to actual practice in the source code files associated with identifier “LGTPa45351” on or before October 29, 2002.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

  
Ajay Pratap Singh Kushwah

1/24/2008  
Date

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Venkatesha Murthy

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Date